

We claim:

1. A suction device for an internal combustion engine, comprising:
  - a casing having an air inlet and a plurality of outlets;
  - a filter in the casing for filtering air from said air inlet;
  - a collection chamber in the casing for receiving air from the filter;
  - at least one throttle valve in the casing for controlling the flow of air from said filter to said collection chamber; and
  - a plurality of suction pipes, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets.
2. A suction device according to claim 1, having a filter unit containing said filter, said filter unit having an inlet and an outlet and being elongate from said inlet to said outlet, an air distribution unit is formed by said plurality of suction pipes and said collection chamber; and distribution unit and the filter unit are mounted said-by-side perpendicular to the direction of elongation of the filter unit and are joined at a common wall.
3. A suction device according to claim 1, having a detector for detecting the rate of air flow between said filter and said collection chamber.
4. A suction device according to claim 3, wherein said detector is a hot-wire air flow meter.
5. A suction device according to claim 1, having a connection path in said casing between said filter and said collection chamber, said connection path containing said throttle valve.
6. A suction device according to claim 5, wherein said plurality of suction pipes are arranged side-by-side in a predetermined direction and said connection path extends perpendicularly to said predetermined direction.
7. A suction device according to claim 1, having a control device for controlling said engine, said control device being

in said casing between said filter and said collection chamber.  
8.A suction device according to claim 1, having a plurality of fuel injection valves and wiring associated with said fuel injection valves, wherein said wiring is located in said collection chamber.

9.A suction device according to claim 1, having an exhaust recirculation passage communicating with said plurality of suction pipes.

10.A suction device according to claim 1, having a plurality of swirl control valves in said plurality of suction pipes, and a common shaft for driving said swirl control valves.

11.A suction device according to claim 1, further including a plurality of swirl ducts in the casing, the swirl ducts extending from said collection chamber to said plurality of outlets.

12.A suction device according to claim 11, also having a plurality of swirl control valves in said plurality of suction pipes for controlling the relative flows of air from said collection chamber of said plurality of outlets through the plurality of suction pipes and the plurality of swirl ducts.

13.A suction device according to claim 11, wherein two of said plurality of swirl ducts are associated with each of said suction pipes, each of said outlets is circular, and each said suction pipe is separated from the associated two swirl ducts of said outlets by walls being chords of said circle.

14.A suction device according to claim 1, wherein a wall divides said collection chamber into first and second regions, some of said suction pipes extending from said first region and others of said suction pipes extending from said second region; and

there is a control valve in said wall for controlling air pressure between said first and second regions.

15.A suction device according to claim 14, wherein said at

least one throttle valve comprises first and second throttle valves, said first throttle valve communicating with said first region and said second throttle valve communicating with said second region.

16.A suction device for an internal combustion engine, comprising:

- a air distribution unit having an inlet and a plurality of outlets, said air distribution unit having a collection chamber for air and a plurality of suction pipes each of said suction pipes extending from the collection chamber to a corresponding one of the outlets;

- A filter unit for filtering air having an inlet and an outlet and being elongate from said inlet to said outlet; and

- a connection path connecting the outlet of the filter unit to the inlet of the air distribution unit;

- wherein the air distribution unit and the filter unit are mounted side-by-side perpendicular to the direction of elongation of the filter unit and are joined at a common wall.

17.A suction device for an internal combustion engine, comprising:

- a casing having an air inlet and a plurality of outlets;

- a collection chamber in the casing for receiving air from the air inlet;

- a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

- a plurality of swirl ducts in the casing, the swirl ducts extending from said collection chamber to said plurality of outlets; and

- a plurality of suction pipes for controlling the relative flows of air from said collection chamber to said plurality of outlets through the plurality of suction pipes and the plurality of swirl ducts.

18. A suction device according to claim 17, having a common shaft for driving said swirl control valves.

19. A suction device for an internal combustion engine, comprising:

- a casing having an air inlet and a plurality of outlets;

- a collection chamber in the casing for receiving air from the air inlet;

- a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

- a plurality of swirl ducts in the casing, the swirl ducts extending from said collection chamber to said plurality of outlets;

- wherein two of said plurality of swirl ducts are associated with each of said suction pipes, each of said outlets is circular, and each said suction pipe is separated from the associated two swirl ducts of said outlets by walls being chords of said circle.

20. A suction device for an internal combustion engine, comprising:

- a casing having an air inlet and a plurality of outlets;

- a collection chamber in the casing for receiving air from the air inlet;

- at least one throttle valve for controlling the air received by the collection chamber from said air inlet;

- a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

- wherein:

- a wall divides said collection chamber into first and second regions, some of said suction pipes extending from said first region and others of said suction pipes extending from said second region; and

- there is a control valve in said wall for controlling air pressure between said first and second regions.

21. A suction device according to claim 20, wherein said at least one throttle valve comprises first and second throttle valves, said first throttle valve communicating with said first region and said second throttle valve communication with said second region.

22. An engine assembly comprising:

- an internal combustion engine having a plurality of cylinders arranged in a V-shape; and

- a suction device, said suction device having:

- a casing having an air inlet and a plurality of outlets;

- a filter in the casing for filtering air from said air inlet;

- a collection chamber in the casing for receiving air from the filter;

- at least one throttle valve in the casing for controlling the flow of air from filter to said collection chamber; and

- a plurality of suction pipes, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

- wherein each of said plurality of suction pipes is connected to a corresponding one of said plurality of cylinders.

23. An engine assembly according to claim 22, wherein said suction device is located within said V-shape of said cylinders.

24. An engine assembly comprising:

- an internal combustion engine having a plurality of cylinders arranged in a V-shape; and

- a suction device, said suction device having:

- a air distribution unit having an inlet and a plurality of outlets, said air distribution unit having a collection chamber for air and a plurality of suction pipes each of said suction pipes extending from the collection chamber to a corresponding one of the outlets;

- a filter unit for filtering air having an inlet and an outlet and being elongate from said inlet to said outlet; and

a connection path connecting the outlet of the filter unit to the inlet of the air distribution unit;

wherein the air distribution unit and the filter unit are mounted side-by-side perpendicular to the direction of elongation of the filter unit and are joined at a common wall; and

wherein each of said plurality of suction pipes is connected to a corresponding one of said plurality of cylinders.

25. An engine assembly comprising:

an internal combustion engine having a plurality of cylinders arranged in a V-shape; and

a suction device, said suction device having:

a casing having an air inlet a plurality of outlets;

a collection chamber in the casing for receiving air from the air inlet;

a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

a plurality of swirl ducts in the casing, the swirl ducts extending from said collection chamber to said plurality of outlets; and

a plurality of swirl control valves in said plurality of suction pipes for controlling the relative flows of air from said collection chamber to said plurality of outlets through the plurality of suction pipes and the plurality of swirl ducts; and

wherein each of said plurality of suction pipes is connected to a corresponding one of said plurality of cylinders.

26. An engine assembly comprising:

an internal combustion engine having a plurality of cylinders arranged in a V-shape; and

a suction device, said suction device having:

a casing having an air inlet and a plurality of outlets;

a collection chamber in the casing for receiving air from the air inlet;

a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

plurality of swirl ducts in the casing, the swirl ducts extending from said collection chamber to said plurality of outlets;

wherein two of said plurality of swirl ducts are associated with each of said suction pipes, each of said outlets is circular, and each said suction pipe is separated from the associated two swirl ducts of said outlets by walls being chords of said circle; and

wherein each of said plurality of suction pipes is connected to a corresponding one of said plurality of cylinders.

27. An engine assembly comprising:

an internal combustion engine having a plurality of cylinders arranged in a V-shape; and

a suction device, said suction device having:

a casing having an air inlet and a plurality of outlets;

a collection chamber in the casing for receiving air from the air inlet;

at least one throttle valve for controlling the air received by the collection chamber from said air inlet;

a plurality of suction pipes in the casing, each of said suction pipes extending within the casing from the collection chamber to a corresponding one of the plurality of outlets;

wherein:

a wall divides said collection chamber into first and second regions, some of said suction pipes extending from said first region and others of said suction pipes extending from said second region; and

there is a control valve in said wall for controlling air

pressure between said first and second region; and

wherein each of said plurality of suction pipes is connected to a corresponding one of said plurality of cylinders.